## REMARKS

In the Office Action dated October 4, 2005, claims 1-29 were pending. Claims 1-6, 8-20 and 24-29 were rejected and claims 7, 21 and 22 were objected to. Claims 1, 2, 4-5, 12-14, 18-20 and 26-29 were rejected under 35 U.S.C. §102(b) as being anticipated by Erpelding et al. (U.S. Pat. No. 4,996,623). Claims 1-3, 5-6, 8, 11-17, 19-20, 24, 25, 27 and 29 were rejected under 35 U.S.C. §102(b) as being anticipated by Endo et al. (U.S. Pat. No. 5,864,446). Claims 9 and 10 were rejected under 35 U.S.C. §103(a) as being obvious in light of Endo et al. Claims 7, 21 and 22 were objected to as depending from a rejected base claims, but were indicated to be allowable if rewritten in independent form. Claim 23 was indicated to be rejected on the Office Action Summary form, but the Office Action did not specify a grounds for rejection and no specific rejection was made with respect to any prior art of record.

### Rejections - 35 U.S.C. §102(b)

Claims 1, 2, 4-5, 12-14, 18-20 and 26-29 were rejected under 35 U.S.C. §102(b) as being anticipated by Erpelding et al. (U.S. Pat. No. 4,996,623). Amendments to independent claims 1, 12 and 29 clarify the originally claimed attachments or connections made between suspensions and actuator arm assemblies.

Amended independent claim 1 relates to a suspension assembly and requires a multi-layer laminate substrate having an interconnect path that terminates at the attachment region at a plurality of connection points. The connection points collectively provide an electro-mechanical connection between the multi-layer laminate substrate and the actuator arm.

Amended independent claim 12 relates to a suspension assembly and requires a multi-layer laminate substrate having an attachment region for both mechanically and electrically connecting the multi-layer laminate substrate to an actuation assembly.

Independent claim 23 relates to an assembly for mechanically and electrically linking an actuator arm with a slider supporting a read/write head proximate a rotating disc. The assembly according to independent claim 23 requires a multi-layer substrate having an attachment region for

attachment to an actuator arm and an interconnect path terminating at the attachment region at a connection point to provide an electro-mechanical attachment to the actuator arm.

Amended independent claim 29 relates to a data storage device that requires an actuator arm assembly and an integrated suspension assembly including an attachment region having multiple electrical connection points that collectively provide a mechanical attachment to the actuator arm assembly and electrical connections to the actuator arm assembly.

Erpelding et al. discloses a laminated suspension assembly that can be mechanically attached to an actuator arm by conventional techniques, such as using machine screws, laser welding or epoxy bonding. (Erpelding et al., col. 5, ll. 17-28). Electrical connections between the laminated suspension and the actuator arm are not specifically disclosed by Erpelding et al. However, the conventional mechanical attachments disclosed by Erpelding et al. would not create electrical connections. Indeed, techniques such as epoxy bonding would specifically create an insulating, not conductive, mechanical connection. Separate electrical connections would have to be made through a separate process, such as an additional manufacturing step to make conventional soldered electrical connections between the interconnect pads and leads or traces on the actuator arm. These soldered connections are not mechanical connections that form structural connections between components (i.e., to support the laminated suspension on the actuator arm), but rather form conductive paths between components.

Erpelding et al. does not show, teach or disclose each and every limitation of independent claims 1, 12, 23 and 29. Those claims each require an electro-mechanical connection, which is a term used to mean a connection that is both a mechanical connection and an electrical connection. Such a connection enables the creation of a structural connection between the suspension and the actuator arm and an electrical connection between the interconnection path traces of the suspension and the electrical components on the actuator arm. (See, e.g., p. 9, ll. 2-7; p. 10, line 26 to p. 11, line 1; p. 12, ll. 8-15; and p.12, line 26 to p. 13, line 1). The October 2, 2005 Office Action notes that "the interconnect path [of Erpelding et al.] terminates at pads at the attachment region at a connection point to provide an electro-mechanical attachment to the actuator arm (figures

3 and 4 clearly show the interconnect traces ending in the attachment region)." (10/4/2005 Office Action, p. 2, ¶2). However, Erpelding et al. does not, in fact, disclose *electro-mechanical attachments (or both mechanical and electrical connections)* at the attachment regions, or the interconnect pads thereof, as required by independent claims 1, 12, 23 and 29. Rather, Erpelding et al. discloses only the use of separate mechanical and electrical connections between the laminated suspension and the actuator arm assembly, which relate to conventional attachment techniques that do not contemplate all the elements of independent claims 1, 12, 23 and 29. In Erpelding et al., mechanical connections between the laminated suspension and the actuator arm to provide structural support are conventional. (Erpelding et al., col. 5, ll. 17-28). In addition, the electrical connection to the interconnect path (103/104) at its pads would be a separate connection made by conventional techniques, which would require a separate manufacturing step to make separate electrical connections. (Cf. p. 3, ll. 9-14). Indeed, the figures of Erpelding et al. depict a pair of conventional mounting hole structures at the arm portion (106) that are adjacent to and spaced from the interconnect pads. (Erpelding et al., FIGS. 4 and 5).

Thus, Erpelding et al. does not show, teach or disclose each and every limitation of independent claims 1, 12, 23 and 29 because Erpelding et al. does not disclose structures that enable an electro-mechanical connection (or both an electrical and mechanical connection) to be made between a laminate or multi-layer substrate and an actuator arm assembly. Independent claims 1, 12, 23 and 29 are therefore allowable over Erpelding et al., and notification to that effect is requested. Claims 2 and 4-5 depend from amended independent claim 1 and include all of the limitations of that base claim. Claims 13-14 and 18-20 depend from amended independent claim 12 and include all of the limitations of that base claim. Claims 26-28 depend from independent claim 23 and include all of the limitations of that base claim. Therefore, for the reasons discussed above, all of dependent claims 2, 4-5, 13-14 and 18-20 are also allowable over Erpelding et al.

Claims 1-3, 5-6, 8, 11-17, 19-20, 24, 25, 27 and 29 were rejected under 35 U.S.C. §102(b) as being anticipated by Endo et al. (U.S. Pat. No. 5,864,446). Endo et al. discloses a multi-layer head assembly (41) that includes an attaching hole (45a) and a number of interconnect pads or

nodes ($47_1$-$47_4$). (Endo et al. col. 4, ll. 50-58; FIGS. 6A and 6B). Endo et al. describes a conventional swaged attachment of the head assembly (41) to an actuator arm or carriage arm (40), where a ball (62) is passed through the attaching hole (45a) of the head assembly (41) to mechanically deform a portion of the head assembly (41) to secure it to the carriage arm (40). (Endo et al. col. 7, ll. 1-6; FIGS. 10A and 10B). In addition, Endo et al. discloses a glued (i.e., adhesive) attachment of the head assembly (41) and carriage arm (40), where the glue is separated from the interconnect traces or signal conducting pattern (47) by the protection cover (46). (Endo et al. Col. 7, ll. 12-20). The nodes ($47_1$-$47_4$) would be connected to traces or leads (63) on the carriage arm (40) separately, through an additional process. (Endo et al., col. 7, ll. 26-29; col. 4, ll. 52-58; see also col. 5, ll. 18-19). Conventional processes include a type of soldering using gold ball connections could be utilized, as is described with respect to electrically linking the magnetic head (44) to the nodes ($47_5$-$47_8$) of the head assembly (41). (See Endo et al. col. 5, ll. 18-19).

Endo et al. does not show, teach or disclose each and every element of independent claims 1, 12, 23 and 29. The October 2, 2005 Office Action notes that "the interconnect path [of Endo et al.] terminates at pads ($47_1$-$47_4$) at the attachment region at a connection point to provide an electro-mechanical attachment to the actuator arm (as shown in figure 6A)." (10/4/2005 Office Action, p. 3, ¶3). However, Endo et al. does not, in fact, disclose *electro-mechanical attachments (or both mechanical and electrical connections)* at the attachment regions, or the interconnect pads thereof, as required by independent claims 1, 12, 23 and 29. Rather, Endo et al. discloses the use of conventional mechanical attachments to structurally secure the head assembly (41) to the carriage arm (40) and the use separate electrical connections, which require separate manufacturing steps beyond process of making the mechanical attachment. (Cf. p. 3, ll. 9-14). The nonconductive glue used by Endo et al. to mechanically secure the head assembly (41) to the carriage arm (40) cannot form an electro-mechanical (or both a mechanical and an electrical connection), because it is specifically taught that the glue is separated from the interconnect traces or signal conducting pattern (47) by the protection cover (46) to prevent interruption of electrical signals carried along the interconnect path. (See Endo et al. Col. 7, ll. 12-20).

Thus, Endo et al. does not show, teach or disclose each and every limitation of independent claims 1, 12, 23 and 29 because Endo et al. does not disclose structures that enable an electro-mechanical connection (or both electrical and mechanical connection) to be made between a laminate or multi-layer substrate and an actuator arm assembly. Independent claims 1, 12, 23 and 29 are therefore allowable over Endo et al., and notification to that effect is requested. Claims 2-3, 5-6, 8 and 11 depend from amended independent claim 1 and include all of the limitations of that base claim. Claims 13-17 and 19-20 depend from amended independent claim 12 and include all of the limitations of that base claim. Claims 25 and 27 depend from independent claim 23 and include all of the limitations of that base claim. Therefore, for the reasons discussed above, all of dependent claims 2-3, 5-6, 8, 11, 13-17, 19-20, 25 and 27 are also allowable over Endo et al.

Rejections - 35 U.S.C. §103(a)

Claims 9 and 10 were rejected under 35 U.S.C. §103(a) as being obvious in light of Endo et al. (U.S. Pat. No. 5,864,446). As discussed above, Endo et al. does not disclose or suggest each and every element of amended independent claim 1. Claims 9 and 10 depend from amended independent claim 1, and include all of limitations of that base claim. It is therefore submitted that dependent claims 9 and 10 are allowable with amended independent claim 1. Thus, all of the pending claims are in condition for allowance. Notification to that effect is requested.

It is further noted that teachings related to grounding are not directly applicable, because a single grounding connection would not contemplate electrical connections at a plurality of interconnect pads, which must be isolated from each other to prevent shorting the circuit(s).

## CONCLUSION

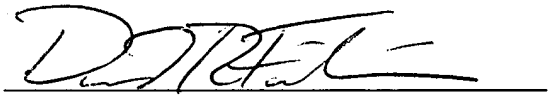
Upon review of the cited art, applicant believes that all of the pending claims patentably define the invention over all of the cited art. Applicant believes the above amendments and remarks place all pending claims in allowable form and respectfully requests a Notice of Allowance.

The Commissioner is authorized to charge payment of any additional fees associated with this paper or credit any overpayment to Deposit Account No. 11-0982.

Respectfully submitted,

KINNEY & LANGE, P.A.

Date: 12/16/05

By: 

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